

NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Custom-Configured Infrared and Broadband Optics

Meller is offering custom-fabricated ir and broadband optics. Lenses and planar optics can be made of a variety of materials including sapphire, germanium, silicon, calcium fluoride, zinc sulfide and zinc selenide. Prisms can be made from rutile and strontium titanate.

The ir and broadband optics are available with AR coatings and can be



fabricated to MIL-O-13830 specifications in prototype or production quantities and in sizes from microminature to 5 in. Delivery takes 6-8 weeks. Literature is available on request. *Meller Optics, 120 Corliss Street, P. O. Box 6001, Providence, Rhode Island 02940*

Circle number 140 on Reader Service Card

Noncontact Laser Vibration Sensor

Optodyne has a new, noncontact vibration sensor based on the firm's LDDM III laser Doppler displacement meter, which uses a helium-neon laser. The vibration sensor also in-

cludes an IBM-compatible 386 PC with an interface card for data collection at various rates, and Optodyne's vibration data-analysis software. The LDDM vibration sensor measures and records vibration displacements to a resolution of 1 nm at rates of up to 800 000 data/sec.

The vibration sensor is said to have a high signal-to-noise ratio and a large dynamic range, to need no calibration and to set up easily. The frequency response is to 50 kHz, and the sensitivity is 0.01 g at 1000 Hz. The included data collection and data analysis software can do differentiation and power-spectra-density analysis. Software packages for fast Fourier transforms, filtering and shock-response spectra are available as options. *Optodyne, 1165 Mahalo Place, Compton, California 90220*

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Measuring Resistance of Superconductors

Keithley Instruments has three new test systems designed for accurately measuring the resistance of superconducting materials. A full-function variable-current system consists of Keithley's Model 181 nanovoltmeter and a Model 224 programmable current source. This system has a maximum resolution of 100 nΩ. A multiple-sample test system adds the Model 705 or 706 scanner and appropriate cards to the full-function variable-current system to permit measurements on multiple samples. In the third, pulsed-current test system, a Model 580 micro-ohmmeter is substituted for the current source and nanovoltmeter.

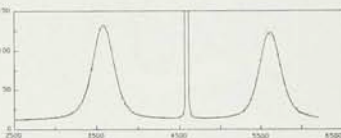
All the instruments are available with an IEEE-488 interface. Demonstration software is available for use with an IBM PC, AT or equivalent with a DOS operating system.

These instruments, we are told, significantly reduce errors in measuring the resistance of superconductors

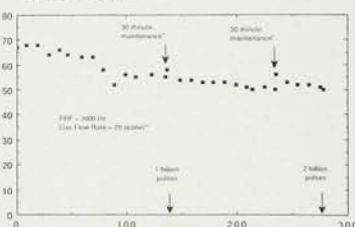
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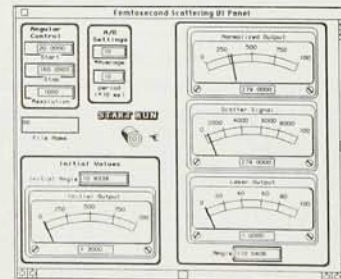
Now there's an inexpensive, easy-to-use physics data acquisition and analysis alternative with all the power of traditional mini-computers. A system that lets you acquire, view, analyze, edit and store real-world signals incredibly fast, then print reports complete with graphics.



MicroHertz surface spectroscopy using a MacADIOS II system from GW Instruments, by Prof. Eric Mazur, Harvard University



Laser lifetime testing with a MacADIOS II SE, by Huy Lo, Potomac Photonics



Light scattering experiment using a MacADIOS II, by Prof. Edward Fry, Texas A&M University

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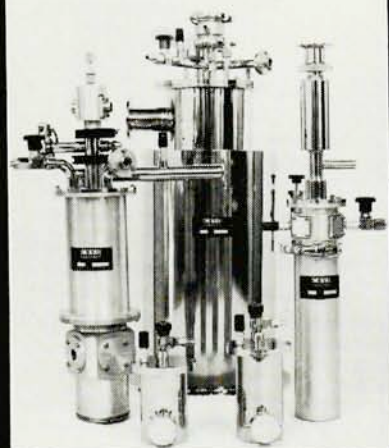
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by using dc techniques (that measure the sample under in-use conditions, minimize cable inductance and capacitance effects, and minimize noise susceptibility); by employing a low-lead-resistance, four-wire measurement method; and by using a bipolar dc source that minimizes thermal EMFs. *Keithley Instruments, 28775 Aurora Road, Cleveland, Ohio 44139*
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Thin Film Resistor Coater

Vacuum Inc is now offering the Ohmega-2 thin-film resistor coater. The Ohmega-2 uses dual magnetrons in a large drum to provide multilayer deposits and allows both dc and rf modes.

The system's cathodes are 3.5 in. wide by 15 in. long. They are arranged in a V-shaped array and have independently operating shutters. The chamber is a 24-in. cube, and the drum has an outer diameter of 20 in. The system has semiautomatic or fully automatic processor controls. Evacuation may be by either a 10-in. cryogenic pump or a diffusion pump; a high-speed mechanical pump is included for fast cycling.

Power supplies may be any combination of dc and rf types. All supplies and controls are built into the framework. *Vacuum Inc, 5541 Central Avenue, Boulder, Colorado 80301*
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400-MHz-Bandwidth Digitizing Oscilloscope

Hewlett-Packard's HP 54504A two-channel digitizing oscilloscope is said to provide a 200-megasample/sec digitizing rate and a 400-MHz repetitive bandwidth. With dual eight-bit flash analog-to-digital converters, the instrument is designed for work with analog and mixed signals and can be used for analyzing acoustical and mechanical phenomena. Its low-noise design and the dual converters, HP believes, provide the effective resolution exceeding that of competitive instruments with up to 10 A-D bits.

In its real-time mode, the instrument's front end is limited to a bandwidth of 50 MHz—one-fourth the digitizing rate. Placing such limits on the single-shot bandwidth suppresses aliasing and preserves waveform fidelity.



The HP 5450A's repetitive sampling system provides 50-psec timing resolution. A logic-triggering feature lets users trigger on, capture and display elusive glitches. This feature can be set to trigger on an edge (rising or falling), a pattern (three-bit patterns of high, low or "don't care"), a time-qualified pattern (a pattern present for less than, greater than or within a range) or a state (that is, to trigger on a pattern using one of the scope's three inputs as a clock).

The vertical accuracy of the scope is claimed to be 1.5%. The instrument's digitizing features include automatic measurement statistics, user-defined measurement-limit testing, dual-time-base windowing, TV and video triggering (line and field for NTSC, PAL and user-defined video formats), autoscale or single-keystroke instrument setup, 16 automatic pulse-parameter measurements, advanced logic and glitch triggering, an HP-IB (IEEE-488) interface for fully programmable data acquisition and control, and pushbutton hard-copy output to HP graphics printers or plotters. The HP 54504A is priced at \$6450. *Hewlett-Packard Company, 3000 Hanover Street, Palo Alto, California 94304*
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Fast Preamps for Infrared Detectors

EG&G Judson is marketing three new low-noise preamplifiers designed to optimize dc and high-speed performance of low-impedance infrared detectors such as those based on InAs and HgCdTe.

The Model PA-350 offers dc performance with photoconductive HgCdTe. It features an adjustable gain of 0-60 dB, a dc bandwidth to 1.5 MHz and an internal detector-biasing network. The PA-350 includes user-adjustable dc-offset compensation for zeroing the detector's dc level.

Models PA-080/34 and PA 090/34 have bandwidths to 20 MHz and 50 MHz, respectively, for low-noise,

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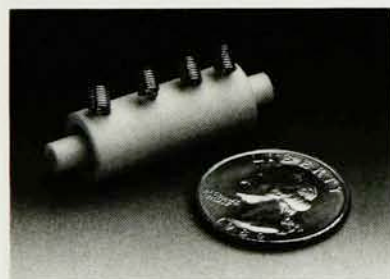
high-speed operation of InAs or HgCdTe detectors. Both models have 34-dB gain and include detector-biasing networks.

When purchased with a Judson detector, each preamp is matched to the detector for optimum performance. The preamps are also sold separately. *EG&G Judson, 221 Commerce Drive, Montgomeryville, Pennsylvania 18936*

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Microsized Ultrahigh-Vacuum Motor

Burleigh Instruments has recently introduced its Microinchworm series of compact, ultrahigh-vacuum-compatible motors that are almost a factor of two smaller than the company's previous models. These motors are made entirely from low-outgassing materials, including alumina, PZT ceramic, silver and beryllium copper.



They can withstand 150 °C bakeout temperatures. In ultrahigh-vacuum positioning applications, a Microinchworm motor will occupy relatively little space inside vacuum chambers and should allow quick pump-down sequences. The small size of the motor gives it rigidity and a high resonant frequency, particularly important features for scanning-tunneling-microscope applications. *Burleigh Instruments, Burleigh Park, Fishers, New York 14453*

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Sequential Atomic Absorption Spectrophotometer

Analyte's FS800 atomic absorption spectrophotometer is designed to determine the concentrations of up to 12 elements in a single liquid sample at a rate of about 3 sec per element. The FS800 is said to provide fast sequential multielement analysis of a single sample—previously possible only with inductively coupled plasma systems—while preserving all the tradi-

tional advantages of flame atomic absorption spectroscopy, including freedom from most spectral interferences and the ability to analyze concentrated samples and organic solutions.

The FS8000 comes with a furnace and an autosampler for liquids. It also includes a hydride generator, which uses simple chemistry to convert some of the sample elements to gaseous hydrides. The hydride generator can determine mercury concentrations and low-level traces of arsenic, bismuth, antimony, selenium, tin and tellurium in rapid sequence.

The FS800 can be upgraded to analyze directly solid samples containing as many as 24 elements. *Analyte, 611 Southeast L Street, Grants Pass, Oregon 97526*

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Low-Cost 1.3- μ m Laser Diode

Seastar's Model XTO-43 is a low-cost 1.3- μ m laser diode, hermetically sealed in a TO-18 package with a 5.6-mm-diameter base. The threshold current is typically less than 30 mA, with a maximum output power of 6 mW. The back-facet monitor photodiode has an InGaP structure for fast response. Applications include optical communications and sensor work. *Seastar Optics, 316 Second Avenue South, Seattle, Washington 98104*

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Ultrathin Zirconia Ceramic for Superconductors

The Japanese firm JCF has Ceraflex, an ultrathin (0.05-mm) zirconium oxide ceramic material offered in sheets and strips. Ceraflex has been formulated for high flexural strength and fracture toughness to provide ease of handling and fabrication of superconducting coils and magnetic shields. The Ceraflex product, containing either 3 or 5 mol % yttria, can be bent around a radius as small as 0.025 in. It is available in strips up to 100 $\times$ 10 mm and in sheets 100 $\times$ 100 mm. The material, it is claimed, is resistant to chemical corrosion and elevated temperatures and can be accurately laser machined. Further information on Ceraflex is available through Marketech International, 414 South Craig Street, Suite 300, Pittsburgh, Pennsylvania 15211

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